

PATENT APPLN. NO. 10/541,573
RESPONSE UNDER 37 C.F.R. §1.111

RECEIVED
CENTRAL FAX CENTER

PATENT
NON-FINAL

AUG 20 2008

IN THE CLAIMS:

1. (currently amended) A seal ring to be mounted in a ring groove provided on an outer circumferential surface of a shaft, the seal ring comprising an outer circumferential face, an inner circumferential face, and pressure-relieving side and contact side faces between said outer circumferential face and said inner circumferential face; said seal ring dimensioned and configured to receiving a receive pressure from oil supplied to the ring groove at its pressure-receiving side face and its inner circumferential face to achieve sealing by its contact side face which is opposite to the pressure-receiving side face and comes into contact with a wall face of the ring groove and its outer circumferential face, wherein

a plurality of circumferentially extending concaves are provided along an inner circumferential part of the contact side face and separated from each other along the circumference of the side face by columnar surfaces,

each end of each of said plurality of circumferentially extending concaves converges with a surface of the side face to form a converging point, adjacent converging points being separated from each other by said columnar surface,

each of said columnar surfaces extends radially outwardly from a line extending between adjacent converging points to an outer circumferential edge of the side face,

each of the concaves is formed by a first deepest inclined portion face provided in the inner circumferential part of the side face of the seal ring, the first deepest inclined portion face being provided to reduce a thickness of the seal ring toward an inner circumference of the seal ring, and

a second inclined portion face is provided on an inner circumferential side of each columnar surface and extends radially inwardly from said line extending between adjacent converging points to the inner circumferential edge of the side face of the seal ring to reduce the thickness of the seal ring toward the inner circumference of the seal ring, ~~the converging portion converges toward the innermost points of the column portion, said first deepest inclined face and second inclined face extending continuously from the contact side face to the inner circumferential face.~~

2. (currently amended) The seal ring according to claim 1, wherein

an inclination angle measured with respect to a plane perpendicular to the axial center of the seal ring of the first deepest inclined ~~portion~~ face is in the range from 8° to 45°, and a dimension (L) between an outermost point of the first deepest inclined ~~portion~~ face in the radial direction and the outer circumferential face of the seal ring is 0.4 mm or larger and is equal to or smaller than 2/3 of the thickness (a1) of the seal ring in the radial direction.

3. (currently amended) The seal ring according to claim 1, wherein

an inclination angle measured with respect to a plane perpendicular to the axial center of the seal ring of the second inclined portion is in the range from 8° to 60°, and a dimension (M) of the second inclined ~~portion~~ face in the radial direction is in the range from 1/5 to 1/2 of a dimension (a1 - L) from the inner circumference of the seal ring to an outermost point of the first deepest inclined ~~portion~~ face in the radial direction, where a1 is the thickness of the seal ring in the radial direction and L is a dimension between an outermost point of the first deepest inclined ~~portion~~ face in the radial direction and the outer circumferential face of the seal ring.

4. (currently amended) The seal ring according to claim 1, wherein

a width of the first deepest inclined portion face in the circumferential direction is 8 to 50 times as large as a width of the second inclined portion face in the circumferential direction, and a number of the concaves included in said contact side face of the seal ring is in the range from 4 to 16.

5. (currently amended) The seal ring according to claim 2, wherein

an inclination angle measured with respect to a plane perpendicular to the axial center of the seal ring of the second inclined portion face is in the range from 8° to 60°, and a dimension (M) of the second inclined portion face in the radial direction is in the range from 1/5 to 1/2 of a dimension (a1 - L) from the inner circumference of the seal ring to an outermost point of the first deepest inclined portion face in the radial direction.

6. (currently amended) The seal ring according to claim 2, wherein

a width of the first deepest inclined portion face in the circumferential direction is 8 to 50 times as large as a width of

the second inclined ~~portion~~ face in the circumferential direction, and a number of the concaves included in said contact side face of the seal ring is in the range from 4 to 16.

7. (currently amended) The seal ring according to claim 3, wherein

a width of the first deepest inclined ~~portion~~ face in the circumferential direction is 8 to 50 times as large as a width of the second inclined ~~portion~~ face in the circumferential direction, and a number of the concaves included in said contact side face of the seal ring is in the range from 4 to 16.

8. (currently amended) The seal ring according to claim 5, wherein

a width of the first deepest inclined ~~portion~~ face in the circumferential direction is 8 to 50 times as large as a width of the second inclined ~~portion~~ face in the circumferential direction, and a number of the concaves included in said contact side face of the seal ring is in the range from 4 to 16.